The EXCAVATING ENGINEER

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Bee Tree Dam

Describing the Work of the Dempster Construction Company, Prominent Contractors of the South. Building of a Hydraulic Fill Dam, Involving a Considerable Amount of Shovel Work.

A DAM to be built — a contract — the Dempster Construction Company — a real combination. Such a combination means a big job, some mighty interesting work, and a contract finished right on time.

The herein described job is the building of a dam for the city of Asheville, North Carolina. Asheville is a thriving city with a population of about 50,000, located in the western part of North Carolina. The past few years have seen such a rapid growth that the water facilities were unable to meet the demand during the summer months.

Actual operations were started early in 1925. After looking around in search of the most desirable site — a site that would offer considerable possibilities in view of the future growth of the city — a position in the Blue Ridge Mountains was decided upon. This site is about 15 miles east of Asheville, near the city of Swannanoa, and located on Bee Tree Creek, thus has evolved the name "Bee Tree Dam."

Five Brothers Comprise the Company

The Dempster organization is a well-known company, popular among contracting circles in the South. It has a touch of the unique, in that the organization consists of five brothers. They organized in 1917, incorporated under the laws of Tennessee. The five brothers own all the common stock, with officers as follows: Geo. R. Dempster, President; Jno. S. Dempster, Vice-President; W. J. Dempster, Vice-President; Thos. C. Dempster, Treasurer; Robt. B. Dempster, Secretary.

This organization has done a great deal of highway work and railroad work. In the State of Kentucky they have completed better than 125 miles of Federal Aid work. They have done considerable work for the Louisville and Nashville Railroad and the Southern Railroad. They built the Carr's Fork extension for the Louisville & Nashville Railroad, and the Guest River Extension for the Interstate Railroad, connecting the Norfolk & Western Railroad with the Chesapeake & Ohio Railroad, and numerous other small projects that are not so well known. Since their organization this company has never been idle, and have been fortunate in holding their organization together, as they have some of the best shovel engineers in the game in their employ.

Dimensions and Description of Dam

Before going into the details of the construction and excavation work for Bee Tree Dam, a few

Left—Looking Down Along the Borrow Pit at the East Side of the Lake.

Below — One of the Larger Machines Excavating for the Spillway.

dimensions and figures concerning the finished dam will give some idea of the magnitude of the undertaking, and what the Dempster Construction Company had laid out before them.

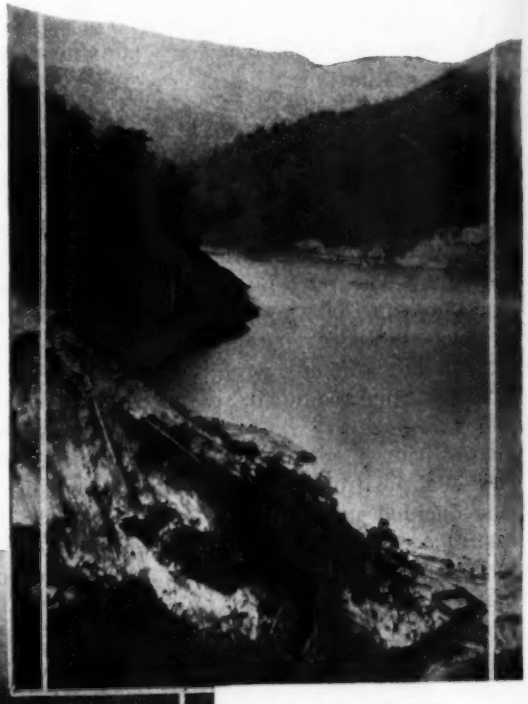
The capacity of the reservoir formed by Bee Tree Dam is 650,000,000 gallons, and will supply the city of Asheville at their present rate of water consumption for four months without using water from any other source. The maximum depth is about 100 feet, and the length is about five-eighths of a mile. It takes about two months to fill the reservoir, and it can be drained in one week. The water shed feeding the reservoir is heavily wooded and covers eight square miles, all of which is fenced and is patrolled by wardens, whose duties are to prevent trespassing and keep down fires.

The dam is of the semi-hydraulic fill, earth type, composed of an upstream dike and a downstream dike with an impervious core between, formed by washing the finest particles of clay from the two dikes, and allowing them to settle in the segregation pool between the dikes. It is approximately 900 feet across the top. The maximum height is 180 feet; the maximum thickness is 700 feet; the width across the top is 30 feet. The total yardage in the dam is about 888,000 cubic yards. The upstream side has a slope of 3 to 1 and the downstream side has a slope of 2½ to 1. The core has a slope of ½ to 1, and is as wide at the bottom as the dam is high. Ninety-five per cent of the material in this core will pass a hundred mesh screen. This extremely fine material, together with the thickness of the core, assures perfect water tightness.

As the first step in building the dam, the surface material was excavated down to bed rock. This involved the moving of a little over 80,000 cubic yards of material, all of which was wasted on the spoil dump below the dam site. For this excavation, five shovels were on the job at all times. Two Bucyrus 50-B 1¾-yard steam shovels carried out the heavy part of the work and two ¾-yard Erie shovels with a small McMyler were used for cutting dinkey tracks and doing odd clean-up work about the job.

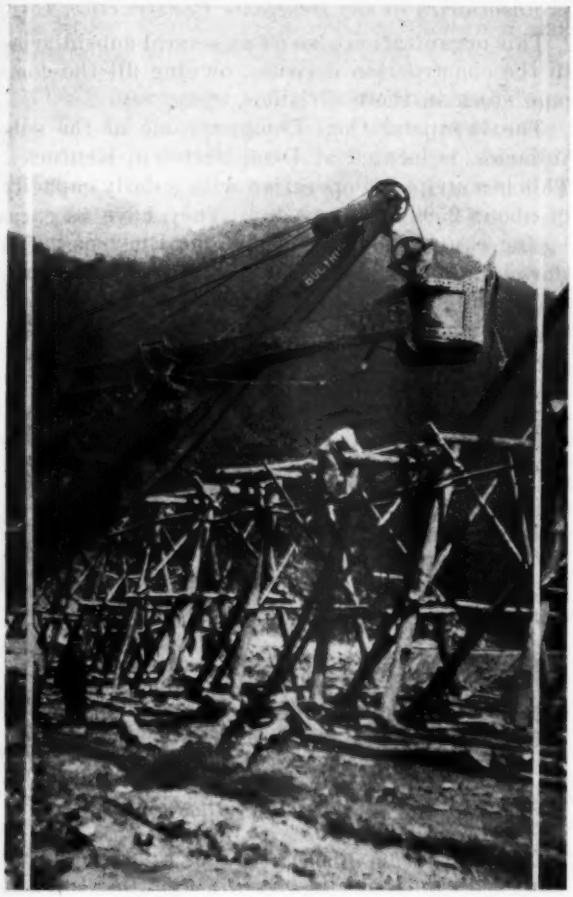
Building Up the Dikes

After this first cut was made down to bed rock, giving a firm foundation for the core of the dam, work was started on building up the two dikes, an upstream dike and a downstream dike, with the puddled core in the center. This was done in a series of lifts, with the bulk of material being secured by opening a borrow pit alongside the mountain above the dam. Low trestles were built, one near the outside slope of the dam and one near the inside slope. These were built of rough timber secured in the woods adjoining the stream. One of the 1¾-yard machines was used in this work as a crane, with a piece of chain hooked on one of the dipper teeth. On these trestles, narrow-gauge track was laid, extending to the borrow pits above the dam, where the larger shovels were put



Above — Looking Up the Valley from the Dam, Showing Typical Mountain Scenery.

Left — Digging at the West End of the Dam, Encountering Some Tough Going.



One of the Shovels Being Used as a Crane While Moving to the West Side of the Dam on to Another Section of the Excavation Work.

to work excavating the material. Thus the dam was built up on two sides by dumping from the trestles, leaving the storage in the center for the puddled core.

Hard Digging Encountered at Borrow Pits

At the borrow pit the shovels encountered some hard digging. The material consisted of a large amount of boulders and masses of rock, which necessitated shooting. Black powder, triple F, and 40 per cent dynamite, was used for the blasting. A number of drills were kept busy on the job, not only at the borrow pits but wherever else there was any amount of digging. Two Ferguson well drills, two Ingersoll-Rand jackhamers, six Sullivan jackhammers, one Denver jackhammer, two Ingersoll-Rand 8 x 8 air compressors, gasoline driven, two Sullivan 6 x 6 air compressors and one Sullivan steam unit, with a 75 H. P. boiler, comprised the drilling and compressor equipment on the job. The average output of the two shovels in the borrow pit totaled approximately 30,000 yards a month for each machine. This output is considered very good in view of the hard digging encountered by the machines. The best day's run for one of the machines was 440 5-yard cars in one ten-hour shift. Some 850,000 cubic yards of material were taken out at the borrow pits and dumped on the dam by the trestle method. For haulage twenty-four 5-yard Koppel side dump cars and eleven 8-yard Oliver side dump cars were used. The locomotive power used in pulling the cars consisted of three 18-ton and two 14-ton Porters, and one 12-ton Glover. A total of 1½ miles of narrow-gauge track was laid for this job, consisting of 60 and 70-pound rail.

Building the Core

As the material was being dumped from the trestles, a pump was put to work pumping water into the basin formed thereby, getting ready to make the core. A Le Courtney 7-stage pump with 212 pounds pressure at 500-foot head, equipped with a 300 h.p. Sterling, 8-cylinder gasoline-driven motor, was used for this work. As soon as sufficient water had been pumped into the storage, two pump boats carrying hydraulic guns were put into operation, moving back and forth across the length of the dam, sluicing the material down into the center of the dam, forming the puddled core. These two pump boats were built right on the dam. They were plain scows, size 12 feet by 18 feet by 9 feet high. The pumping equipment consisted of Allis-Chalmers one-stage pumps, powered by 150 h.p. Sterling Marine engines, gasoline driven, direct connected. The hydraulic guns were mounted on top the houses of the boats on a platform built for this purpose. With this outfit it was possible to deliver as high as 600 pounds per square inch, but as such a high pressure was not needed the average pressure used was 250 pounds to the inch. A laboratory was maintained at all times to test the materials washed into the core. Two tests were run each week to make sure that the material was fine enough to insure a watertight core.

Looking Down the Valley from the Dam, Showing the Construction Camp.

Conduit and Spillway

Concrete work about the dam was done by the Howerton Engineering Company of Asheville, North Carolina. The overflow tunnel or conduit is seven feet high and 700 feet long, containing about 1200 yards of concrete. At the end of this conduit is a 42-inch Johnson valve, which controls the flow of water when draining the reservoir. This valve is so constructed that it uses water pressure to open and close itself; it works so easily that a child could operate it. At the upper end of the conduit is an intake tower through which water is fed to the water main leading into Asheville. This tower is built of reinforced concrete 120 feet high, and with an inside diameter of 8½ feet. The spillway was also built by this company, and contains some 4000 cubic yards of concrete. Atlas cement was used throughout in the concrete work.

Water Main to City

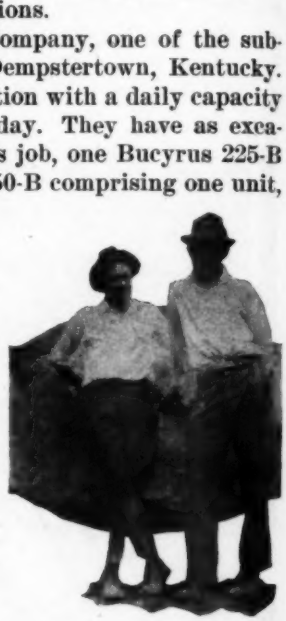
The 24-inch cast iron water main leading to Asheville was laid by Kelly & Wilson of Asheville, who are enjoying a wide prestige in the South for this kind of work, having completed some of the largest projects of this kind. This particular line is twelve miles long, and is capable of delivering 7,000,000 gallons of water per day to the reservoir on Beaucatcher Mountain at Asheville.

The shovel operators who worked on the Bee Tree Dam are as listed below: Bucyrus 50-B — George Jones, operator, James Hughes, fireman, J. C. Nichols, night operator, Lawrence Frees, night fireman; Bucyrus 50-B — S. E. Wright, operator, J. W. Wright, fireman, Horace Quarrels, night operator, Leonard Allen, night fireman; McMyler shovel — Will Smith, operator, Mack Stypes, fireman; Erie shovel — W. A. Lewis, operator, Richard Davis, fireman; Erie shovel — J. W. Franse, operator, Chas. Hughes, fireman, A. S. Hancock, night operator, and Jim Shepherd, night fireman.

Subsidiaries of the Dempster Construction Co.

This organization also owns several subsidiaries to the construction division, owning all the common stock in these divisions.

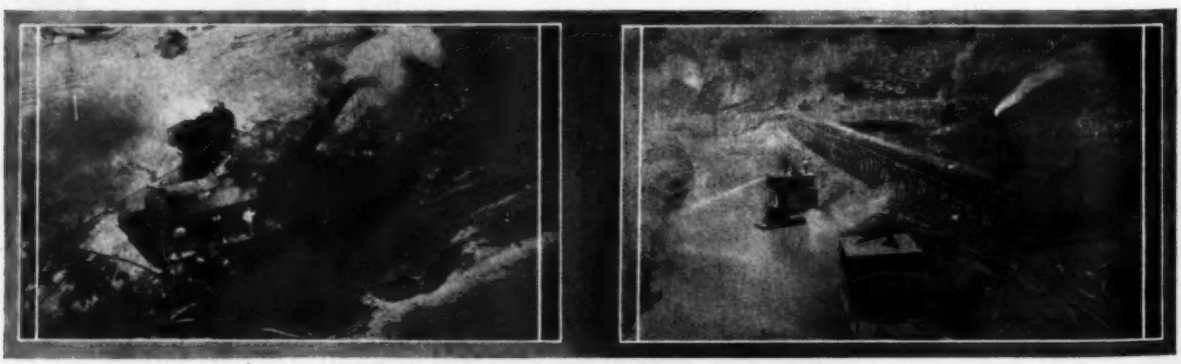
The Dempster Coal Company, one of the subsidiaries, is located at Dempstertown, Kentucky. This is a stripping operation with a daily capacity of about 2500 tons per day. They have as excavating equipment on this job, one Bucyrus 225-B shovel and one Bucyrus 50-B comprising one unit, and one Marion 37 comprising unit number two. This is known as the largest stripping operation in west Kentucky, equipped with an electrical tipple and all modern mechanical equipment used in the strip mining field. About 200 men are employed at this mine, giving some idea of its real value. This subsidiary was incorporated under laws of Delaware.



E. M. Jones, Resident Engineer of Charles E. Waddell Company, and John Dempster, of the Dempster Construction Company.

The Dempster Equipment Company, another division of the organization, has the name of being the "South's Largest Shovel Dealers." They handle all kinds of contractors' equipment, dealing in new and used shovels. They also maintain a modern shop to rebuild shovels, a shop equipped with a large electrical crane and every modern shop convenience.

The Chas. E. Waddell Company, consulting engineers, had charge of the engineering of this dam. They are very widely known, and have designed and built some of the largest projects in Western North Carolina. The resident engineer was Mr. E. M. Jones, city engineer, Mr. R. C. Thomas, and Mr. C. E. Hoey was assistant superintendent for the city of Asheville.



Left — Excavating for the Spillway at the West End of the Dam. Right — Looking west along center of dam, showing trestle being built for next lift at right. Material dumped at left is being washed into the core by pump boats.

Basement Excavation in Chattanooga, Tennessee

The Brown Contracting Company Makes a Splendid Record While Digging Under Adverse Conditions, Contending with Heavy Traffic in a Congested District and Complaints Against Smoke Nuisance

JUST four years and a couple of months ago, D. L. Brown of Chattanooga, Tennessee, formed the Brown Contracting Company; which has been very active in road construction and general excavation. The company has completed some very fine work, and has made a name for itself by the prompt manner in which they have completed their contracts.

Work Completed in Past

One of the more important jobs this company has completed is the construction of 22 miles of road in the Cumberland Mountains between Monteagle and Altamount. This job in the midst of beautiful scenery, mountain air and most pleasant surroundings was finished in one year, exceedingly good time when one considers that the entire job was in a mountainous, rough country involving a considerable amount of heavy grading.

Another piece of work done by the company was the excavation for a new roadhouse near Chattanooga, Tennessee, and close to Lookout Mountain, famous for the "Battle Above the Clouds," which was fought on its sides during the Civil War.

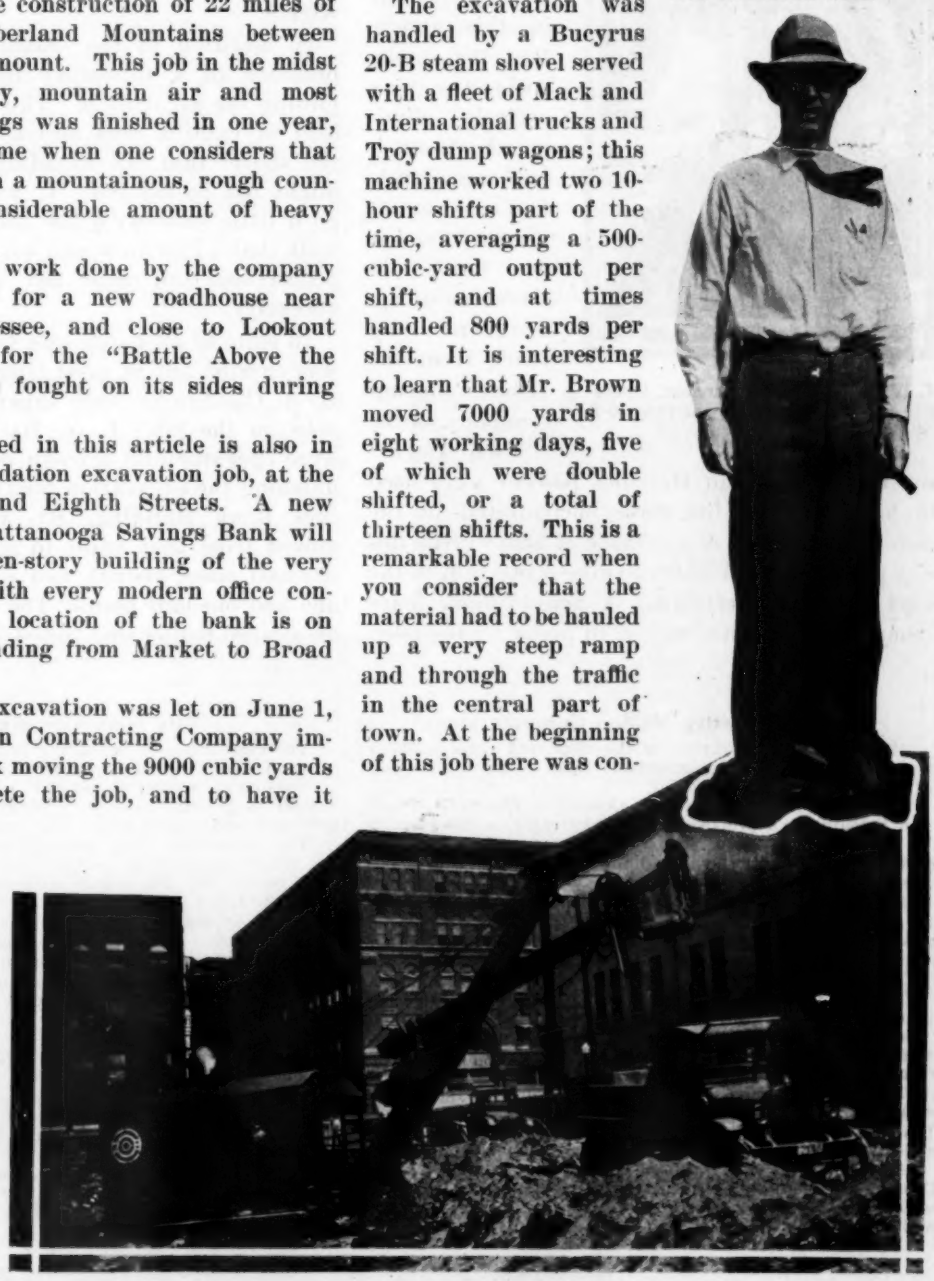
The work described in this article is also in Chattanooga, a foundation excavation job, at the corner of Market and Eighth Streets. A new building for the Chattanooga Savings Bank will be located here, a ten-story building of the very latest design and with every modern office convenience. The new location of the bank is on Eighth Street, extending from Market to Broad Street.

The contract for excavation was let on June 1, 1926, and the Brown Contracting Company immediately set to work moving the 9000 cubic yards necessary to complete the job, and to have it cleaned up and all ready for the building contractor to put in the foundation. The excavation was carried to an average depth of thirteen feet below sidewalk level. In one place, however, where the boilers are to be set, the excavation was carried down to a depth of twenty feet. The material encountered was composed of about 90% clay, the remainder being limestone, which necessitated a little blasting.

Coke Used for Fuel

The excavation was handled by a Bucyrus 20-B steam shovel served with a fleet of Mack and International trucks and Troy dump wagons; this machine worked two 10-hour shifts part of the time, averaging a 500-cubic-yard output per shift, and at times handled 800 yards per shift. It is interesting to learn that Mr. Brown moved 7000 yards in eight working days, five of which were double shifted, or a total of thirteen shifts. This is a remarkable record when you consider that the material had to be hauled up a very steep ramp and through the traffic in the central part of town. At the beginning of this job there was con-

D. L. Brown himself, a contractor who puts real pep into excavation work.



This gives some idea of the type of material being handled. Mr. Brown made a remarkable record by moving 7000 yards of material in eight working days, five of which were double shifted.

siderable objection to the use of a steam shovel because of the smoke nuisance. The operations were in a congested downtown office district, and there were many complaints from the tenants of the adjacent buildings. It was then decided to burn coke. This was worked out very successfully, and the fireman experienced no difficulty in keeping a full head of steam. It will be seen from the illustrations in this article that the smoke nuisance was entirely eliminated. About a half ton of this fuel was burned per shift, and it was hauled to the scene of operations by truck from the Hibbler Barnes Company yards.

L. V. Barber and C. Sinalen, Operator and Fireman of the Bucyrus 20-B Shovel.

Two Ingersoll-Rand drills and Hercules powder were used to break up the limestone encountered in the course of digging. A mat made of heavy cross ties was placed over the shots to give protection to the workers and pedestrians. A heavy plank fence around the area also served to protect passersby.

Heavy Traffic to Contend With

Traffic was very heavy during the whole day, since the operations were right in the center of the downtown district. Added to the heavy traffic were changing traffic signals, which naturally slowed down the trucks. A quite heavy haulage fleet was necessary. It consisted of seven Mack trucks, three International trucks and fifteen Troy dump wagons. The average length of haul was one and a half miles, although at places the material was hauled as far as two and a half miles. Mr. Brown used the material for filling in lots, giving them a higher real estate value. Some of the material was also used for raising streets.

In addition to the traffic handicap was the presence of a four-story building directly adjoining the excavation. This meant that a great deal of caution was necessary in manipulating the shovel that the foundation of this building might not be injured. It was also necessary to go a little slow with the bank next to the sidewalk that a cave-in would not occur and endanger pedestrians and cause any more lost time than necessary.

In spite of all handicaps, however, the contract was carried out in good time. P. B. Niven and B. A. Clonninger were superintendent and foreman on the job. L. V. Barber and C. Sinalen were operator and fireman on the shovel. After finishing the excavation for the Chattanooga Savings Bank Building, Mr. Brown's shovel was moved from that point to another job, two and one-half miles distant, and was working again in one and one-half hours. The machine was placed on a large trailer and towed by two Mack trucks.

First Make Fifty Million Computations

"Let's change the rates," is the dominant note in every discussion of the railway question. Easy as tearing a sheet off a last year's desk calendar.

For a month the Interstate Commerce Commission has been listening to a proposal to readjust rates on the lines in the area between New York on the east, Pittsburgh and Buffalo on the west, the Canadian border on the north and Virginia on the south.

Seven thousand five hundred stations would be affected. To establish the proposed mileage scale as a basis for rate-making it would be necessary to find the distance from every point to every other point.

That would require more than fifty million computations.

To save going into the computing business the roads took about one-fifth of the stations, none of them more than twenty miles from another, and figured the mileage. More than two million computations, and a big, heavy book for the Commission to study.

That applies to one section of the country alone, and would affect only one-third of the tonnage in that section. Take into consideration the entire United States and the mind staggers.

As Mr. Mark Potter said, on retiring from the Interstate Commerce Commission, the making of railway rates is a science that few have mastered. A highly complex science, we'll add. — *The Nation's Business.*

Fire from Compressed Air

The inhabitants of the Malay Peninsula make a tiny pump of wood, about 3 inches long with a ½-inch bore.

This pump is open at one end and closed at the other, like a small deep cup. In it fits a plunger with a round knob at the outer end, and a piston-like expansion at the other.

The piston end of the plunger is dipped in tinder, which the native carries in a moth's cocoon — an absolutely watertight container. The piston is then placed in the pump and the knob struck sharply.

The compression of the air in the pump raises the temperature to such a degree that the tinder is ignited, and when the piston is withdrawn it is found to be glowing.

The native blows on the glowing piston, and presto! he has a fire. This method is quicker by far than the method used by most primitive races.

Near Bellefonte, Pennsylvania, there is a small lake of considerable value to farmers and fishermen of that neighborhood.

The water is maintained in the lake at the desired level by a dam about 200 feet long, which has been gradually giving out for want of repair.

As the cost of repairing the structure seemed prohibitive nothing was done; but fortunately for those depending on the water, a group of beavers took hold of the matter and skillfully mended the dam.

UMI

The Use of Caterpillar Mounting Under Railroad-Type Shovels in the Stone Quarry

What the General Crushed Stone Company of Easton, Pennsylvania, Have Learned About Caterpillar Traction

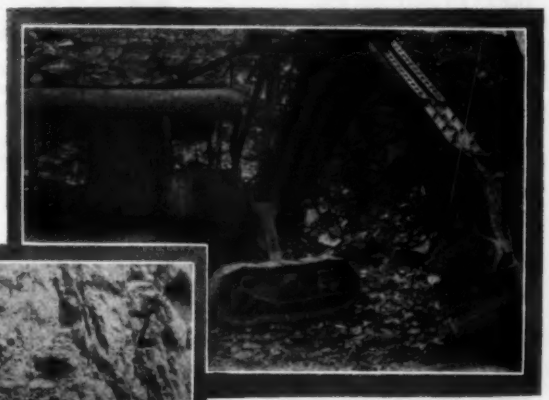
THE General Crushed Stone Company, at present with general offices in Easton, Pennsylvania, was incorporated in the year 1900 under the laws of the State of Delaware with main offices at Bethlehem, Pennsylvania. The company at that time was known as the Duerr Contracting Company, and in addition to having a ballast plant at the Jerome Park Reservoir, New York, located on the New York Central, had three plants on the Lehigh Valley at Redington, Pennsylvania, Wilkes-Barre, Pennsylvania, and North Le Roy, New York. In 1902 the name of the Corporation was changed to The General Crushed Stone Company, and since that time the company has gradually grown to its present size. The present officers of the company are John Rice, President, H. H. Mitchell, Secretary and Treasurer, and Otho M. Graves, Vice-President and General manager. The first two named were officers of the company when it was incorporated in 1900.

Today this company operates ten quarries and plants, and operates some fourteen shovels, practically all of which are railroad-type machines. These plants, of which each one has from 1,000 to 3,800 tons capacity per ten-hour day, are situated in Massachusetts, Pennsylvania, New York and Maryland, and their efforts are concentrated entirely upon the production of crushed stone for railroad ballast, highway construction and other commercial purposes.

Ten Plants Give Excellent Opportunity for Study

In the ten plants of the General Crushed Stone Company the comparison of railroad-truck mounting and caterpillar mounting has been admirably carried out. In these plants the conditions, of course, vary quite a little, and the material quarried also covers a wide range, as they operate in trap rock, hard limestone, quartzite and syenite. Thus the conclusions based on their experience are the results not only of observation under one set of conditions but under a wide range of conditions.

In the old days, and, in fact, up until three years ago, all of this company's railroad shovels were mounted on railroad trucks, and their first caterpillar installation was made in 1923. The first installation was made with the thought of carefully observing the results, so that later the decision could be made as to whether or not all plants should be similarly equipped. Therefore, three different plants were chosen, with conditions widely varying. The success of these first



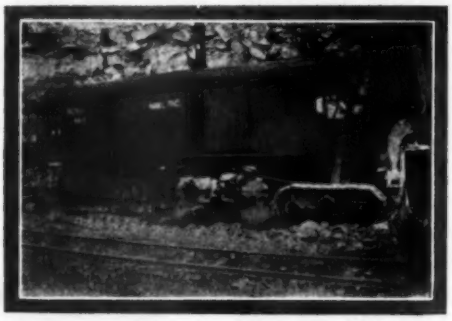
(Above) Digging Limestone at the Geneva, New York, Plant — a Bucyrus 70-Ton.

(Left) In the Trap Rock Quarry at Winchester, Massachusetts — a Marion Model 91 Loading 7½-ton Mack Trucks.

UMI

A Small Revolving Shovel Mounted on Crawlers Loading Sandstone at the White Haven Plant — a Marion 36.

One of the Railroad Shovels on "Cats," Loading Sandstone into 7½-ton Mack Trucks at the Company's White Haven, Pennsylvania, Quarry.



This shovel, a Bucyrus 70-C, is loading limestone at the Geneva, New York, plant. Note the water in which the machine is working.

A Bucyrus 95-C Digging Syenite at the Little Falls, New York, Plant of the General Crushed Stone Company.

mountings, and the ones that followed them, have resulted in the company's putting this mounting under practically all of their shovels.

Twenty Per Cent Increased Production and Lower Labor Cost

The outstanding advantage that the General Crushed Stone Company has found in their many plants has been that the continuous-tread mounting has enabled the quarries to load approximately twenty per cent more material in a 10-hour day than could be loaded with the same shovel mounted

This is the original "tractor" equipment for the shovels of the General Crushed Stone Company. This shovel, at the Company's North Le Roy, New York, plant, had caterpillars installed under it in May, 1923.

on railroad trucks and operating under the same conditions. This increased production is naturally in many cases a very important factor.

In addition to this greater output of rock, the caterpillar traction brings about a saving in labor cost, since it cuts down the number of men required in the pit crew. The labor saving is not the all-important item, as it takes second place to the increased production.

Mr. Frank S. Jones, Production Engineer of this large quarry organization, has made careful studies of the results of caterpillar mountings, and sums up the advantages with the following: "In spite of the saving in labor, unless an increased production is both possible and desirable, the caterpillar equipment will not justify its cost, as the saving in labor alone is not sufficient to pay for the caterpillar equipment over what might be expected to be its normal life." The forward units of the railroad shovel caterpillar mounting are located on arms which take the same position that the jack arms did; thus the arc of digging, when the dipper is in close to the shovel, is somewhat decreased. It is also true that the caterpillars make it a little more difficult to place large rocks against the bank in order that they may be drilled at a later time. The company's opinion of this type of mounting, however, is well shown by the fact that today eleven out of thirteen railroad shovels owned by them are caterpillar mounted.

In some of the plants the shovels are loading into 5-yard contractor-type cars which are hauled to the initial crusher by locomotives on 36-inch gauge track. During the past year the company has equipped two plants with 7½-ton motor trucks to get a comparison between this method of transportation to the primary crusher and the more or less standard method of using locomotive-drawn cars.

The shovel equipment at this company's plant consists of 95-C Bucyrus shovels, Model 91 Marion, 70-C and 70-ton Bucyrus shovels, as well as Model 76 and Model 60 Marions.

We are indebted for the information from which this article was written to Mr. Frank S. Jones, Production Engineer of the General Crushed Stone Company.

A Hearty Eater

During the course of a colored festival in a Southern town, Miss Mandy Johnson, a guest from a rural community near by, to whom such a function was a novelty, was approached by a Mr. Spencer, who inquired with great suavity, "Miss Johnson, am yo' program full?" "Lordy, no, Mr. Spencer," said the lady; "it takes mo' dan a san'wich an' two olives to fill mah program!"

Excavation work on the big sewer had reached a low, mucky place and the Italian laborers were having their troubles with the soft mud.

Suddenly there arose a shout.

'C'mear, queek! Bringa da shov! Bringa da peek! Pietro's stuck in the mud up to his knees!"

"Tell him to wade out," shouted the foreman.

"He canna no wade — he wrong end up."

A Marthas Vineyard citizen was notified by his board of health that a permit to keep his pig had expired. Back came the reply: "Dear Board of Helt: Thank you for tole me my permit to keep a pig have expire. I want to tole you my pig have beat you to it. He expire tree week ago." — *Exchange.*

Over the telephone —

Mr. Brown: "Heddo! Ids Bister Sbith id? Heddo! Bister Sbith. Thids ids Bister Brown sbeakig."

Mr. Smith: "Bedder write be a ledder, Brown. I cad hear ad you cad sbeak."

Young Thing (somewhat hesitantly): "I'd like to buy a petticoat."

Floorwalker: "Antique department on third floor, miss."

The EXCAVATING ENGINEER

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The Business Situation

It is customary in the Spring of the year for money rates to rise. This is largely due to increased activity in the Spring in many lines of business. This increased activity, calling as it does for greater borrowing by industry from the banks of the country, tends to decrease the amount of money available for loans, and creates a corresponding firming of interest rates. This year finds rather an unusual situation existing; there is a very decided easing tendency in the money market. Bank loans, through one channel or another, have decreased to such an extent that as this is written the actual earning assets of the Federal Reserve Banks is below a billion dollars for the first time since 1925. This low figure means that there is just that much more money available for lending, and it has brought the money rates down. After going to 5% and 6% during the holiday period, when there is a great commercial demand for funds, call money relapsed during January to 4%, and time money fell off ⅛ to a ¼ to 4½%.

There have been a number of reasons for this extra supply of money. The cautious and conservative management of business, which has been such a decided factor in maintaining business activity at its present level during the past year, is to some extent responsible for the condition, although commercial loans are a good deal higher than at this time last year. Loans secured by stocks and bonds are low, reflecting the recent easy tendency in the stock market. An additional cause for the situation is an increase in the imports of gold which have come to this country from Canada and France. Taken all in all, the money situation should be easier this Spring than is customary at this season of the year.

It is interesting to note that easier money conditions also obtain in other leading money markets of the world, notably England, Germany, and Austria.

The National City Company in their monthly review are quoted in part as follows:

"Building contracts in the final month of 1926 totaled $537,395,800, a total of 2% above December, 1925, bringing the year's total, according to the F. W. Dodge Corporation, to a new high record in excess of $6,800,000,000. Thus the new year begins with probably a larger volume of work under contract than at the start of any previous year.

"Suggestions by the head of a large real estate mortgage house that the country is overbuilt, and that a six months' building halt would be desirable, have again precipitated lively discussion over the status of the building industry. For some time conservative opinion has looked with misgiving upon the methods being pursued in the construction of certain types of apartments and office buildings in various sections of the country, and a warning that indiscriminate building of this character cannot be carried on indefinitely without undesirable results will be approved by all. This is not to say, however, that the country's building requirements in all ways are satisfied or that any drastic shrinkage in the activity of the construction industries is to be anticipated in the near future. Residential building where conservatively planned should and doubtless will go forward, and expenditures for public works, utility, industrial and railway construction and equipment promise to be large during the coming year. Few people, in fact, look for a building total in 1927 very far below that of 1926."

The automobile industry appears to be marking time until a little later in the Spring to lay its plans for the coming year.

The coal industry on the other hand has been exceeding all records for this season, the output for the week ending January 15th being 13½ million tons. During the British coal strike there were heavy exports from this country, but since these have now practically ceased it is assumed that the heavy production now reflects a large amount of coal going into storage.

Bank debits, which include not only checks going through the clearing houses but also checks presented at the individual banks, is a good indication of the total volume of trade throughout the country. The totals for 141 principal cities during the first four weeks of this year show an increase of about 2.6% over the figure for a year ago, although bank clearings run a little under a year ago.

Railroad car loadings for the first two weeks of this year are above the totals for the corresponding weeks in any previous year.

During the past months installment buying has come in for considerable criticism as tending to make it too easy for individuals to overburden themselves financially. It is interesting to note that the effect of the great growth of installment buying may be partially offset by the remarkable expansion of chain stores which practically all demand cash payment. The volume of the business done by these chain stores is shown by the figure of two billion dollars for the amount of business done by the chain system reporting to the Federal Reserve Board and Department of Commerce during 1926, and it should be remembered that this figure does not include any smaller chains not reported.

In spite of the extension of installment buying, apparently a great many more people in the United States are saving their money than formerly. In 1914 there were a little over eleven million depositors in savings banks. In 1920 this figure was a little higher, but about the same. Today there are over fifteen million depositors.

From THE MAIL BAG

"Sirs:

In reply to your card of recent date relative to the discontinuation of The Excavating Engineer.

Mr. A. L. Luke Payne, former Executive Secretary of The Inter-Mountain Branch, has resigned and I would appreciate very much if you would continue to send your magazine to this office, as it is read by nearly all members who spend the winter days in these club rooms.

In order to have the copies come to the office without any trouble I suggest that you mail it direct to the Inter-Mountain Branch A. G. C. of A., 15 Central Building, Salt Lake City, Utah.

Thanking you for the interest you have shown this Branch, I remain,

Yours very truly,
Intermountain Branch, A. G. C. of A.
R. H. GILES,
Executive Secretary."

We learn with a good deal of interest by letter from Charles A. MacDonald of Philadelphia that he has discontinued his organization known as the Du Bois Construction Company of Du Bois, Pennsylvania, and is now doing work under his own name. His specialty is bridges, trestles and paving.

"Dear Sirs:

In regards to the twelve months' subscription for The Excavating Engineer I sent in I haven't received but two issues. Probably I have changed places so often they got lost, so please send it here. I am running a 70-C Bucyrus for Hardaway Contracting Co. on a long job.

Thanking you, I remain,

Yours truly,
P. F. BURKE."

We had Mr. Burke's old address. — *Ed.*

"Gentlemen:

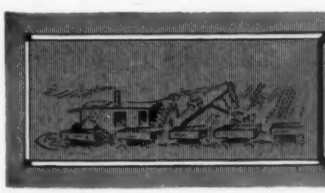
I am a reader of your magazine and I think it is one of the best there is.

I just found out yesterday about the account of the L. E. Myers "L" contract here in Evanston in the February 1925 issue. Could I get a copy of that number? Here is the dime and its postage.

Thank you.

LYNN STILES,
Evanston, Illinois."

Our thanks to Mr. Stiles for his compliment.—*Ed.*



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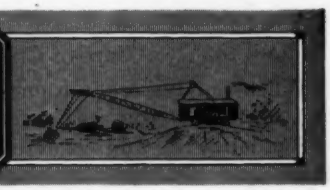


How Sludge Accumulates in the Oil Pan of Your Gasoline Engine

By G. S. HAMILTON

Occasionally users of gasoline engines have been misled into thinking their oil, from its appearance on a bayonet gauge or otherwise, was in excellent shape, because it appeared quite thick and rich. If at any time the oil in the crankcase gives the appearance of being heavier than when it was new, sludge formation may be expected.

Sludge is a mixture of water, oil, fuel and dust. It is a fact that clean oil and water will not mix permanently. Vinegar and salad oil will not mix, for instance, but the addition of the yolk of an egg, salt, pepper, etc., in proper proportions and in the right order, will produce mayonnaise — an excellent example of a very permanent and stiff emulsion.

If any sludge formations are found, it must be that water has found its way into the crankcase. Some slight amounts may enter by way of the

breather pipe in the form of vapor, to be condensed against the cold metal. By far the greater amount, however, comes from the combustion chamber, in this way: Gasoline is a chemical combination of hydrogen (H) and carbon (C). Gasoline burns in air, and by "burning" we mean combining with oxygen (O). This, of course, constitutes about one-fifth of the air we breathe. The carbon in the gas unites with the oxygen to form CO_2, carbon dioxide — a gas which escapes out of the exhaust. But the hydrogen in the gasoline unites with the oxygen to form H_2O — water. Of course, this water is in the form of steam. But when the engine is cold, the metal parts, before they become heated, serve to condense this steam in the combustion chamber in the form of minute drops, which, under the action of the piston, are beaten up with the oil film on the cylinder walls, and, as this film is being continually replaced with oil from the crankcase, soon the water-laden oil is transferred to the crankcase, there to be whipped up with the oil supply by the action of the connecting rods. Sludge — thick, heavy, black and slimy — is the result. It may cause all sorts of trouble, particularly if the screen at the oil pump is small. If the screen has a fine mesh, the sludge will cover it, sometimes causing it to be broken by the vacuum created by the pump — or with less positive a pump system, the oil supply will be cut off, starving the bearings and causing them to burn out.

If sludge is suspected, have your oil pan dropped and thoroughly cleaned, as well as the accessible parts of the inside of the engine. A lintless cloth should be used for this purpose — never use water. A peculiarity of sludge is this; if it has once formed, the very small quantity allowed to remain will promote its further formation when fresh oil is added. The action seems to be, so to speak, infectious.

Care of Chains

When putting a chain on, whether it be new or old, avoid twisting, as this causes excessive wear.

Sudden jerks and excessive overloading will in time cause chain crystallization.

The frequent annealing of chains reduces crystallization and tends to restore the cohesive properties to the molecular particles of the chain material. When annealing a chain it should be piled so that a slow wood fire will heat the complete chain to a cherry red, after which it should be allowed to cool gradually, and remain in the smoldering embers until cold.

Still further life may be obtained by turning the chain end for end, and upside down, in order to change the wear caused by the chain winding around the drum.

Proper lubrication is also very essential. For this purpose the S. G. Taylor Chain Company recommend Gargoyle dark lubricating oil LM or its equal, which may be applied with a brush, swab or with an oil can.

The frequency of lubrication is largely a matter of judgment on the part of the operator. However, it is well to lubricate once per shift under normal conditions, and oftener when the nature of the work demands.

Smoky Smoke

Cleanliness is essential to an efficient boiler. Boilers on excavating machinery are of the most efficient design — they have to be. They must be designed for the limited space they occupy, and this means that the total heating surface cannot be as great for the power requirements as one would have for a stationary plant.

Therefore, it follows that if tubes are all gummed up with soot, and the other side of the tube is covered with scale, that you might just as well place a sheet of asbestos between the fire and the water. Only a portion of the heat is going to get to the water. It is just a question of eating up a lot of coal and not getting the biting power at the teeth.

There is nothing dirtier than heavy, black smoke, and it is simply fuel going to waste.

Keep the fires burning brightly. Never completely cover up a fire, whether it is the fire in your steam shovel boiler or the fire in your furnace at home. Always have a flaming hot spot uncovered to burn the gases from the green coil, and let enough air in over the fire to burn these gases.

With smoky coal, fire in small quantities, and, of course, more frequently.

A thorough realization of these simple facts is just what makes the difference between a good fireman and the other kind.

Clean firing will produce power with comparative ease, while with a dirty fire and scaley tubes, the fireman can sweat and swear himself to a grease spot and not get anywhere.

A little haze of smoke may be all right, and even a good fireman may be caught now and then with heavy smoke, but not for long.

The direct heat loss resulting from the fact that the combustible material in the smoke is not burned isn't in itself so important, probably doesn't amount to more than 2 per cent loss, but the real waste is the insulating effect of that smoke on the heating surfaces, especially the tubes, which keeps the heat from the water.

Filling the tubes with soot checks the draft, and we all know that one cannot have a clean, brisk, hot fire with a poor draft.

DEVICES YOU OUGHT TO KNOW ABOUT

Brookville Locomotive Company Announce New Models

The Brookville Locomotive Company announced two new models of five different weights during the past year. The improvements on these new models is involved in the reverse mechanism, which was not available before. The reverse mechanism in question has enabled them to add heavier models, thus making it possible for the Fordson tractor to handle heavier equipment satisfactorily.

Models FGR, FHR and FIR were especially designed for handling one or more standard freight cars, the number, of course, depending on grade and track conditions. The machine has equal speeds and pulling power in both forward and reverse work. This permits forward drive of Fordson mechanism at all times. While no alteration of Fordson mechanism is made, range of three speeds can be raised or lowered as desired.

On all models, no weight is carried on the Fordson axles, with the exception of drive sprocket and chain. The Fordson merely carries the driving strain, axles being employed as jackshafts.

These models are very well suited for use in coal and clay mines, brick and tile plants, limestone and granite quarries, cement and sand quarries, sugar mills and lumbering.

Further information may be obtained by writing to the *Brookville Locomotive Company, Brookville, Pennsylvania.*

Garford Truck Improved

The Garford Truck Company has announced a new improvement to their line of trucks, the Model 30 for 1½ to 2-ton service. This machine has been given added speed, improved steering apparatus, a more comfortable driver's compartment, and a lower chassis. The transmission has four speeds forward and one

reverse, selective sliding gear type, mounted in unit with clutch. The final drive is worm and worm gear. The frame is pressed steel, 6-inch channel section hot-riveted, reinforced with cross members and gusset plates.

The Garford Company believes that this is a great improvement in the truck field. More information and descriptive folders may be obtained by writing the company at Lima, Ohio.

New Gas Cutting Torch Placed on Market

The Alexander Milburn Company has just placed on the market a gas cutting torch for use with illuminating and by-product gases. It is the result of extensive experiment and research in the use of a cheaper fuel, thereby reducing cutting costs materially.

A bunsen burner, contained within the torch, burns illuminating gas, which heats the cutting oxygen as it passes through a series of copper coils.

The torch operates on city gas or natural gas, which, due to its availability and low cost, minimizes cost of operation and affords a high degree of safety.

The torch is ruggedly constructed of bronze forgings and specially drawn tubing. The high pressure cutting oxygen is controlled by a thumb valve which remains fixed in either open or closed position. The torch is 21 inches long, and supplied with a complete range of tips for light, medium and heavy cutting.

Catalogues and further descriptive material may be obtained by writing to *The Alexander Milburn Company, 1416-1428 West Baltimore Street, Baltimore, Maryland.*

Westinghouse Brings Out Variable Voltage Equipment for Electric Power Shovels

Variable-voltage equipment has been designed by the Westinghouse Electric and Manufacturing Company for application to electric power shovels that eliminates rheostatic losses, thus keeping power costs low, increases the speed of operations, reduces operating expenses and is sturdy in construction. It is particularly designed for the electric power shovels used in coal and iron mines, in quarries, for handling road material, by cement manufacturers, by steel plants for handling ore and slag, and by contractors on dams, canals, tunnels and other large projects.

The motor-generator set used with this equipment consists of a driving motor and three direct-current generators, one for each of the shovel motors.

The direct-current-type motors used with the variable-voltage equipment are so constructed as to be able to stand up under shock and strain, and have a high overload capacity. Stalling or unusual overloads do not injure the motor.

The control of the variable-voltage system is simple but strongly constructed. Three drum controllers, one each for the swing, thrust and hoist motions, govern the speed and direction of rotation of the motors. These controllers handle only the field current of the various generators, which is relatively small, thus eliminating arcing and burning of the contacts. They have removable covers, making them readily accessible.

The quick response of the motors to each movement of the controller handles, and the smooth, accurate control of the swing, hoist, and thrust motions, gives flexibility and enables the operator to drive his machine at full speed continuously.

Protection from dust and grit to all parts of the motors, and safety in operation, are other features that make this variable-voltage equipment advantageous on electric power shovels.

Chicago and Vicinity

BY D. C. ANDERSON

Most Chicago contractors are at present very busy working on their equipment in preparation for a busy year. The writer visited T. M. White, T. M. Madden, Thos. McQueen, John Finn, Herbert Ripley and other large contractors in the Chicago District during the last month and found all making a very intensive effort to get ready for what they think will be one of their big years.

John Bransfield has his Bucyrus 20-B on a job at the Advance Packing Co. on Union Street. As it is very easy digging, he says it is a shame to put a 20-B on such work. Anybody having some tough digging to do should see Bransfield, as he claims his 20-B can only do its stuff under the hardest conditions. J. H. McDaniel is easing the can through the bank, and Albert W. Schultz is manipulating the injector. McDaniel was formerly with W. J. Newman.

A. Ramacitti has his Erie working in Oak Park. T. Wilkins sits in front and S. Ramacitti works behind. Mr. Ramacitti looks for a big year. He already has a 30,000-yard contract ready to start.

John Finn just finished a basement job at 13th and Halsted. He did it with a Thew. E. Heniff is the engineer.

The writer called on Tom Madden and found D. S. Thomas hard at it, taking up bearings and so on. Thomas is an old-time runner, having been on a Bucyrus machine 20 years ago.

Illinois Brick Co. has a Bucyrus railroad-type whose history is lost in times gone by. It has been at the Evanston Quarry at least 25 years. How much longer no one knows.

N. D. Connelly Co. is busy taking out slag at the Iroquois Steel Co. They have a Bucyrus 70-ton and are making a record loading out cars. F. W. Schline, another old-timer, is running the navvy.

J. H. Tracy of the International Brotherhood was visited by the writer last week. He delights in talking about the old days when he was a runner, and can tell a lot of interesting stories about his experiences.

Eastern Notes

BY E. J. O'CONNOR

J. J. McHale & Sons of Pawtucket, Rhode Island, have closed down their reservoir job till spring. They are now collectively touring the country, evidently believing in seeing America first. After viewing the Road Show, their itinerary included the Northwest, Pacific Coast, back along the Gulf States to Florida, a two weeks' respite in Cuba, and they expect to be back on the job the middle of March.

Mr. Sherry of Greaney and Sherry, Fall River, Massachusetts, was in Boston recently. He is all prepared to get an early start on his Taunton job.

Charlie Wright of Springfield plans a busy season. He has a little work to do yet up in Gorham, New Hampshire, having been caught by the very early winter.

Sanders Engineering Company, Portland, Maine, are resting on their oars in the Chicopee job, waiting for the weather to break.

The Winchester plant of the General Crushed Stone Co. are likewise overhauling. Mr. McKeon is busy installing new Bucyrus caterpillars under his Marion 76.

Both the members of the Kelliher Corp. of Turners Falls were at the Road Show. With them were E. C. Sargent, Quincy and M. McKenney of the West Roxbury Trap Rock Co. I understand there were quite a few others there but I failed to locate them.

Jeremiah Sullivan and Sons Co. are also having a quiet winter, although one machine has been in constant use in Billerica.

The Lynn Sand and Stone Company, preparing for a big year, are overhauling their screening plant, and also have purchased a new electric shovel, a Marion 4-81.

J. F. White Co. of Cambridge is doing a small job for Hegeman Harris in Cambridge but otherwise is not very busy.

Cenedella Co. of Milford are not busy this winter. Rumor has it that the Providence reservoir job looks good to them. They were second bidders on a similar job last summer.

The new Paxton road in Worcester is a wonderful stretch of highway. D. Oufro Bros. of Leominater should be proud of it.

New England Notes

BY H. C. DAVIS

Wm. Meyers & Sons of Baltimore, Maryland, has a shovel at work on the Patterson property, Cecil Avenue and Friendship St. This property is being graded for residences. Wm. Wilkerson is the foreman; Al Troublefield is the engineer, and Al, Jr., keeps up the steam. There is about 40,000 cubic yards to be moved on this job.

At another place, the Ten Hills development, Mr. Meyers has another shovel. Chas. Meyer, one of the sons, has charge of this job. John Stansbaugh is running the shovel and Jim Stansbaugh firing. This is another 40,000-cubic-yard contract.

H. O. Frior of Baltimore has a shovel at Collins and Edmondson Avenue. F. W. Schnep is the operator and Leo Hetock is the fireman.

Pacific Coast Notes

BY P. H. BIRCKHEAD

Plans and surveys are being completed by Northern Pacific Railroad Company, St. Paul, Minnesota, bids to be called for during March, for the construction of 63 miles of branch line from Glendive, Montana, to Brockway, Montana, estimated cost $3,000,000.

Plans and specifications are being completed by City Engineer R. D. Van Alstine, City Hall, Long Beach, Los Angeles County, for the construction of approximately 30 miles of sanitary sewers to sewer the harbor district in the City of Long Beach south of Willow Street, west of the Flood control channel, and extending west of Terminal Island to provide sewerage for the Ford Plant at Badger Avenue. Two pumping plants will be required for this project.

Southern California Edison Co., 306 West Third Street, Los Angeles, is planning the following betterments to their system, to cost $42,881,000; Big Creek Construction, $13,400,000; Vincent transmission line and connections Big Creek to Los Angeles, $2,676,000; construction of new steam plant at Long Beach, $4,280,000; 220 k.w. transmission line, Laguna Bell substation to steam plant, $1,175,000; light pipe substation near Long Beach, $2,400,000; additions to Laguna Bell substation, $900,000; rights-of-way, $3,000,000; civil engineering department contingencies $50,000; miscellaneous system betterments, $16,000,000.

SHOTS FROM THE FIRING LINE — Continued

Plans and specifications are being prepared by Engineering Department of Atchison, Topeka and Santa Fe Railroad, Kerckhoff Building, Los Angeles, for following improvements in San Joaquin Valley Division, to cost $2,000,000: (1) Steel bridge with concrete foundations, over branch of San Joaquin River near Orwood, to cost $600,000; (2) Yard improvements at Fresno, Riverbank, relaying rails on various sections of line to cost $1,400,000. Total budget of company for 1927 calls for expenditure of $67,000,000, of which $27,500,000 will be used for new locomotives, freight cars, etc.; balance for relaying 592 miles of track from Chicago to California, and new hotel at Grand Canyon, Arizona.

The Turlock Irrigation District, Turlock, Stanislaus County, has applied to the Federal Power Commission, Washington, District of Columbia, for a power project on the Tuolumne River and its tributaries in Tuolumne and Mariposa Counties, near Groveland, California. It is planned to divert water from the middle and south forks of the Tuolumne River into the Groveland Reservoir to be located in Big Creek, where a rock-fill dam 240 feet in height will be constructed to impound 80,000 acre feet of water. A power house designed to develop 40,500 horse power of electric energy will be built on Tuolumne River, through which the water will be carried into a regulating reservoir of 20,000 acre feet capacity in the river, from which it will be taken through another power house, called the Jacksonville Plant, further down the river, and emptied into the existing Don Pedro Reservoir. At the Jacksonville Plant 12,000 horsepower will be developed. The impounded water will be used for both irrigation and power. The power developed will be used in meeting the District's irrigation pumping requirements, any surplus to be sold for public utility use. Estimated cost of project $5,574,000.

Southern States Notes

BY W. W. WHORLEY

W. P. Scott is stripping overburden for the Hall Construction Co. near Bainbridge, Georgia, with a Bucyrus 30-B Diesel machine.

F. F. Jolley is side casting with an Erie B for the McDowell Contracting Company on a highway job near Nashville, Tennessee. Mr. J. W. Bolton of the above firm is personally supervising this job, as well as two others which they have in Tennessee.

Alvin Barber is operating a Bucyrus 31-B for D. L. Brown of Chattanooga on a heavy piece of highway work near the top of Signal Mountain.

A large number of contractors attended the lettings of the Alabama State Highway Department in January, and some nice projects were awarded, although prices were low.

S. C. Taylor was awarded five miles of grading with sand clay surfacing in Choctaw County.

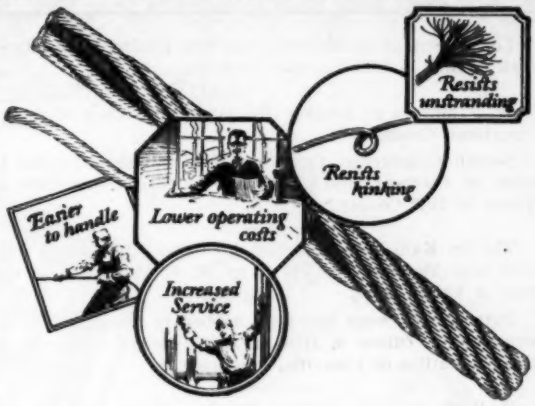
A. H. Singer of LaFayette, Alabama, was low bidder on 8 miles of roadway and top soil surfacing in Coosa County. Mr. Singer also landed 16.3 miles of roadway in Perry County.

W. J. Bryson of Jacksonville, Florida, was awarded 10 miles of roadway and surfacing in Pike County.

Considerable interest was shown and close bids submitted by contractors on the extension work let by the Frisco Railroad between Aliceville and Kimbrough, Alabama.

The Kershaw Contracting Company of Birmingham was awarded all work north of Demopolis.

Nixon & Phillips of Lineville were awarded 10 miles between Vernon and Sulligent in Lamar County.



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SHOTS FROM THE FIRING LINE — Continued

Lonnie Staggs of Bessemer was low bidder on 46 miles of work in Bibb and Tuscaloosa Counties.

W. J. Bryson of Jacksonville landed 8.2 miles of work in Tuscaloosa County.

Newell Contracting Company of Birmingham landed 16.5 miles of roadway and surfacing between Centerville and Milton in Bill County.

The De Kalb County project involving 3.5 miles of heavy work near Mentone was bid in by W. E. Hartline and Company of Valley Head.

Part of this work has been subbed to Morgan & Hill of Birmingham, Oliver & Hill of Little Rock, Arkansas, and Nixon & Philips of Lineville, Alabama.

H. B. Rose writes us from St. Paul, South Carolina, that he is handling a Bucyrus 30-B shovel for the Consolidated Construction Company.

S. J. Thompson is fighting brown ore with a Bucyrus 50-B shovel near Woodstock, Alabama.

E. E. Shamp advises that he is operating a Bucyrus Class-9½ dragline for W. T. Montgomery at Mission, Texas.

R. D. Kelton is handling a Bucyrus 50-B for the Memphis Stone & Gravel Company near Atmore, Alabama.

The work south of Demopolis was let to J. A. Kreis of Knoxville, Tennessee. About half of this work was subbed to S. C. Taylor of Birmingham. The balance has been covered by Mike Costello and J. D. Crippen, both of whom are well-known railroad contractors located at Knoxville, Tennessee. The lighter work is being handled by W. J. Bryson of Jacksonville, Florida.

St. Louis Items

BY. A. B. KOENIG

The Industrial Track Construction Co., St. Louis, was low bidder on construction of a standard gauge railroad track from the present waterworks to a point near the site of the settling basins and coagulent house at Howard's Bend, City of St. Louis, Missouri, water plant.

The Industrial Track Construction Co. are engaged in grading work and construction of second main track for the Wabash Railway between Adrian and Britton, Michigan, which is a continuation of the second track work recently completed between Lima Junction and Adrian. They resumed work on Wabash heavy maintenance program of laying 110-pound rail and reballasting track at various points on Wabash system. This company reports favorable prospect of much industrial track work in St. Louis and vicinity in the spring.

Cameron, Joyce & Co. were awarded contract by the Santa Fe Railroad for an extension out of Mulvane, Kansas. They sublet the team work on this to R. T. Amis, Clyde Leach and James Spencer & Sons, and are going to do the steam shovel work with their own outfits.

J. L. Ward Construction Co. have a shovel outfit working on the Baltimore & Ohio Railroad yards at Youngstown, Ohio. This firm has 60 teams idle that they can place on work immediately. Address them 11,000 Wade Park Avenue, Cleveland, Ohio.

Bids for the construction of 137 miles of cement roads, the first under the $100,000,000 bond issue which were received at Springfield, Illinois, by the State Department of Public Works, are believed to be within the limit of $30,000 a mile, and it is expected contracts will be awarded soon. The Division also received bids for thirty miles of grading and

"More than pleased with its performance"

"My judgment on the purchase of your machine has proven to be very good and I am *more than pleased with its performance.*"

This is the enthusiastic, unsolicited statement of F. M. Hayner, President of the Las Cruces (N. M.) Lumber Co., by Hayner and Burn, concerning their Buckeye after they had tested it thoroughly.

Truly, it's a mighty fine tribute. But Mr. Hayner does more than generalize — he gives actual details as the basis of his satisfaction. In 6 hours and 50 minutes, this Buckeye cut 2020 lineal feet (1065 yards) for 6-inch sewer pipe. The soil varied — 18 inches being hard adobe, balance gravel and sand.

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In writing to Western Wheeled Scraper Co. please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued

eighty separate bridge sections. Among the bids received was one for the completion of a gap on Route 2, DeWitt County, near Clinton, which has been open for more than three years because of court litigation, involving the route through Clinton. The apparent low bidder was the Ernest Berns Company, Indianapolis, for $20,582.30. Apparent low bidders on various contracts were: Section 108, Route 49, Jasper County, .99 miles, R. H. Harshman, $23,923.65; Section 165, Route 59, Lake County, 4.41 miles, McZucken Van Derheyden Construction Co., $107,010.29; Section 119, Route 95, McDonough County, 10.12 miles, William O'Neill & Sons Co., $202,612.65; Route 104, Section 116, Woodford County, 6.13 miles, Cameron, Joyce Construction Co., $134,232.66; Section 113, Route 127, Clinton County, 4.77 miles, Casey Construction Co., $92,841.95; Section 119, Route 157, St. Clair County, 2.64 miles, Louis Rich Construction Co., $67,245.24; Section 112, Route 116, Livingston County, 8.01 miles, Keokuk Quarry & Construction Co., $151,036.64; Section 126B, Route 96, Adams County, bridge superstructure, Herrick Construction Co., steel superstructure, Vincennes Bridge Co.; Section 119, Route 157, St. Clair County, 2.64 miles, Louis Rich Construction Co., $67,245.24; Section 126B, Route 98, Adams County, 4.68 miles, Dees Brothers, $40,575.34; Section 104A, Route 175, Peoria County, .91 miles, Cameron, Joyce & Co., $14,248.76; Section 102A, Route 116, Tazewell County, 4.70 miles, S. J. Groves & Sons Co., $42,074.60; Section 103A, Tazewell County, .277 miles, S. J. Groves & Sons, $42,974.60; Section 105A, Route 121, Tazewell County, 6.85 miles, P. O'Leary & Sons, $91,425.57. Bids for construction on Route 15, Kankakee County, were as follows: Section 101, 5.75 miles, Shidler Construction & Material Co., $60,751.61; Section 101D, .55 miles, Shidler Construction Co., $12,038; Section 102, 6.03 miles, Reginhardt Construction Co., $88,162.80; Section 102D, .53 miles, Shidler Construction Co., $11,033.68; Section 103, 5.98 miles, Reginhardt Construction Co., $121,514.07; Section 103D, .61 miles, Reginhardt Construction Co., $12,151.53.

John Marsch, Inc., report their various jobs in this part of the country as getting along fine.

Fred R. Jones of Fred R. Jones Contracting Co., Cleveland, was with us a couple of days. He put in a bid on the new Frisco Railroad extension through Alabama. A little high. This firm is finishing a large yard at Pontiac, Mich.

Jack O'Leary of the old Cherryvale Construction Co. is back in Kansas. Doesn't think as much of Florida as he did some time ago.

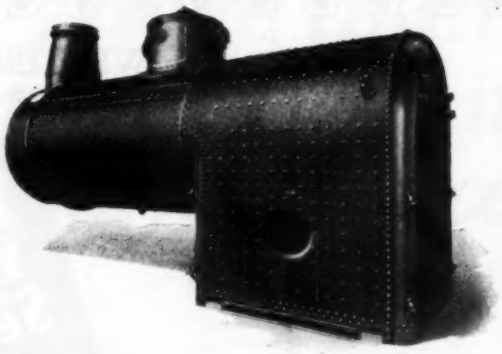
Jim Dougherty of Morris & Dougherty, Globe Building, St. Paul, Minnesota, was here bidding on the new Frisco Florida extension. Dougherty says they have a number of good steam shovel outfits idle they can place on work immediately.

Winston Bros. Co. have a number of shovel outfits at work on the Missouri Pacific Railroad double-track work between St. Louis and Jefferson City, Missouri. This firm has also been awarded a coal stripping job in Western Missouri. Winston-Dear Co. placed an outfit there. E. L. Dorsett is in charge.

A. W. Lane finished his Missouri Highway work and wants a job suitable for a 15-team outfit. Address him 3479 Claxton Avenue, St. Louis, Missouri.

C. F. Nagel, La Grange, Missouri, has a couple of good rock outfits idle and wants a job for them.

J. A. Kreis & Sons, Inc., Knoxville, Tennessee, were awarded contract by the Frisco Railroad for 40 miles of new work on their Florida extension between Demopolis and Kimbrough, Alabama. Connection to be made at Kimbrough with the Muscle Shoals, Birmingham and Pensacola Railroad, which is now owned by the Frisco Railroad, giving it an entrance in the port of Pensacola.



YOU SELECT your equipment for its adaptability to your work.

For its power — speed — durability — rugged strength — efficiency.

Do not all of these depend upon the boiler?

Can you afford to consider anything less than the very best?

DO YOU LOOK FOR

JOHNSTON BROS., Inc.

Specializing in Boilers for Contractors' Equipment

FERRYSBURG, MICHIGAN

In writing to Johnston Bros., Inc., please use post card bound in the center of this number.

Mud Is No Hindrance Here

One of two waste dumps of the General Contracting Company of Chicago disposing of soft, sticky, blue clay. An idea of the consistency of this material can be gained by the rolls of clay at one side where it has been pushed by the spreader.

Imagine trying to shift track by means of jacks and bars on material of this kind. Even with a special footpiece of extra large area, the lifting spud was often pushed down several feet before a solid footing could be secured. In some instances it was necessary to place footpiece on a tie in order to get sufficient foundation. Two protruding ties used for this purpose can be seen.

"If the TRACK SHIFTER will work in this, it will work any place," were the words of the Superintendent. It is doubtful if a more severe condition could be found, yet the machine worked perfectly. It will shift and raise track under conditions where it would be practically impossible for men to work with jacks and bars. There are instances where the use of the machine has resulted in a reduction of 28 men in the track gang. In a few months the machine paid for itself out of labor savings. Wherever used it brings a big return on a small investment.

If you have track that must be moved frequently, or if you have a ballasting job, here is the machine that will save you money. Write Track Shifter Department for Bulletin GR-8.

Nordberg Mfg. Co., Milwaukee, Wis., U. S. A.

THE NORDBERG PATENTED TRACK SHIFTER

In writing to Nordberg Mfg. Co. please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued

Sprague & Neisle finished their Missouri Pacific work near Dundee, Missouri, and have moved this outfit to Texas.

Maloy & Fowler want a job suitable for a small shovel outfit they have idle in Illinois. Globe Building, St. Paul, Minnesota, will catch them.

A new girl arrived at Jack Kennedy's house in East St. Louis on January 16th. Jim Dougherty and Leo Fowler of St. Paul went to visit and congratulate him on the new addition to the family which is growing quite large. Dougherty wanted to know how many children he had now. Jack commenced to figure, thought it was 10 or 11, when Mrs. Kennedy spoke up and said, "Ask him how many mules he has out in the barn. He would not have to do any counting or figuring to tell this." Jack promised to keep a better lineup of his children in the future.

Allhands & Davis were awarded contract for widening bank and cuts on Frisco Railroad in Southern Kansas. E. S. Price is looking after this, doing it with stationmen. They are also working on 60 miles of bank widening and double-track work on the Santa Fe Railroad near Amarillo, Texas.

The W. C. Callahan Construction Co. were awarded contracts for 1,599,611 cubic yards of excavation in Hancock County, Illinois, and 1,292,150 cubic yards of excavation in Adams County, Illinois.

P. J. Hanley, the Pacific Coast labor agent, has opened a labor agency at 57 South Front Street, Columbus, Ohio, to supply a number of his old-time contractor friends on the Hocking Valley Railroad with labor. Hanley was in St. Louis recently, and reports his new office doing a good business. Not much doing out West.

The C. G. Kershaw Contracting Co. of Birmingham, Alabama, were awarded contract to build 50 to 60 miles of the new Frisco Railroad extension between Aliceville and Demopolis, Alabama. The contract covers grading, concrete, building and bridge approach work.

M. C. Robinson was awarded contracts for following Illinois bridges: Slomon bridge near Palmyra, Dikes Bridge of South Palmyra, Horton bridge near Modesto, Combs Bridge near Plainview, and the McClure bridge near Plainview. Two of these bridges are on State Aid Roads.

Costello Bros. are moving a couple of shovel outfits on the Frisco Railroad's new Florida extension through Alabama.

Fruin-Colnon Contracting Co. were awarded contract by the St. Louis, Troy & Eastern Railroad for 7400 feet elevated steel trestle on concrete foundation to carry the railroad overhead through Madison and Venice, Illinois.

Contractors when in want of labor or work for their outfits get in touch with the Koenig Labor Agencies, 612 Walnut Street, St. Louis, Missouri, or 501 Delaware Street, Kansas City, Missouri.

Low bidders on eleven street paving projects which will cost $240,545 were announced February 8th by the Board of Public Service. The successful bidders and the amounts of their estimates follow: Kraft Street, from Manchester southwardly, Perkinson Bros. Construction Co., $30,918.25; Wilson Street, from Edwards to Macklind Avenue, Alfred Lewald, Inc., $11,838.25; Amelia Street, from Wren Avenue to Kingshighway Northwest, Flynn Construction Co., $15,549.10; Farlin Avenue, from Camelia Street eastwardly, Trinidad Asphalt Manufacturing Co., $2,782.80; Bates Street, from Gravois to Eichelberger Avenue, Trinidad Asphalt Manufacturing Co., $12,270.35; Dolman Street, from Lafayette

Why—

do you rarely ever see a WILLIAMS offered for sale by the user ?

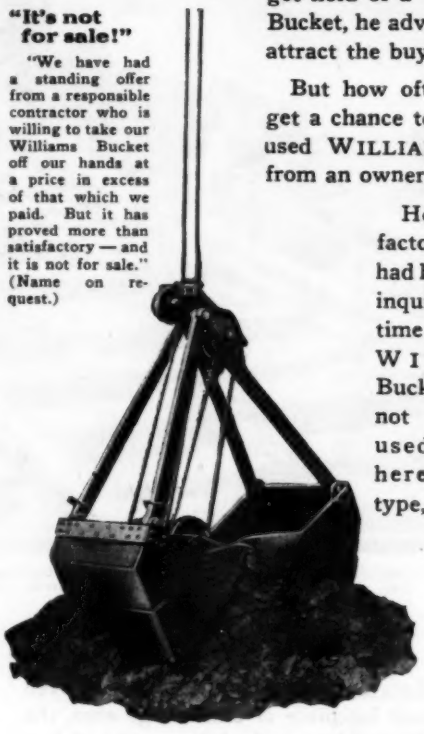
When a dealer in second-hand equipment can get hold of a WILLIAMS Bucket, he advertises it to attract the buyers —

But how often do you get a chance to pick up a used WILLIAMS Bucket from an owner?

Here at the factory we have had half a dozen inquiries at one time for used WILLIAMS Buckets — and not a single used bucket here, of any type, because—

"It's not for sale!"

"We have had a standing offer from a responsible contractor who is willing to take our Williams Bucket off our hands at a price in excess of that which we paid. But it has proved more than satisfactory — and it is not for sale." (Name on request.)



the owners of WILLIAMS Buckets are holding onto them

A man is known by the company he keeps — and a bucket by the years it is kept.

The buckets you can easily pick up in the second-hand market are the ones that "stall" in hard digging, or buckle so that the lips don't come together — or wear out cable and sheaves quickly.

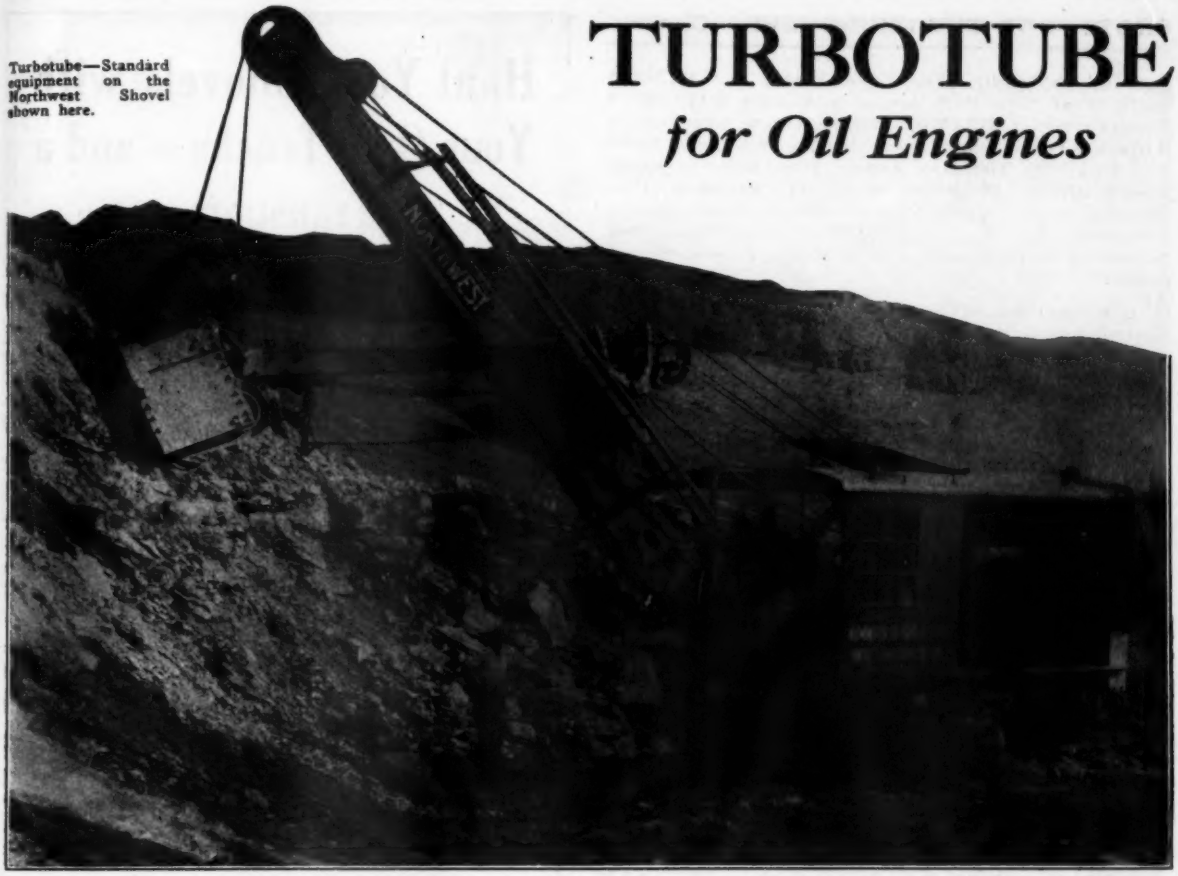
Buy a WILLIAMS for your own work, and you will see why the owners of these fast and dependable buckets don't part with them.

G. H. WILLIAMS COMPANY, 603 Haybarger Lane, Erie, Pa.

Branch Offices: New York, Pittsburgh, Chicago

WILLIAMS
FAST-DIGGING BUCKETS
All Parts Guaranteed Against Breakage

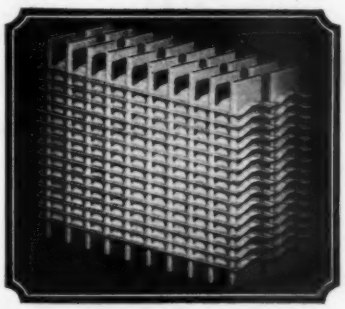
In writing to G. H. Williams Co. please use post card bound in the center of this number.



Turbotube—Standard equipment on the Northwest Shovel shown here.

TURBOTUBE
for Oil Engines

As Successful as Radiator Cooling
for Gasoline Engines



For oil engines any size, any type —1 to 1000 h.p. or more.

Turbotube — developed and built exclusively by Modine — brings at last successful radiator cooling for any size, any type oil engine.

Turbotube is an advanced, new type radiator core, built especially for oil engines and it has proved its outstanding superiority through months of service on all types and sizes of oil engines. Brings new engine efficiency. Effects important economies.

Write today for Bulletin "B" devoted exclusively to oil engine cooling.

Modine Manufacturing Co.
Racine, Wisconsin

MODINE RADIATORS

In writing to Modine Manufacturing Co. please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued

Avenue northwardly, Webb-Boone Paving Co., $11,883.25; Ninth Street, from Park Avenue to Hickory Street, Webb-Boone Paving Co., $12,426.60; Fillmore Avenue, from Colorado Avenue to Grand-Kingshighway, Granite Bituminous Paving Co., $26,178.75; Louisiana Avenue, from Bates to Kansas Avenue, Granite Bituminous Paving Co., $49,609.95; Pennsylvania Avenue, from Stein to Haven Street, Granite Bituminous Paving Co., $57,423.50; Ninth Street, from Hickory to Chouteau Avenue, C. A. Moreno Construction Co., $9,664.50.

L. L. Hardeman of the Missouri Valley Bridge & Iron Co., Leavenworth, Kansas, passed through St. Louis on his way to Arkansas to look over some new bridge work.

B. F. Brooks Construction Co. of Dallas, Texas, have an outfit on state highway work near Belle, Missouri.

Gust Young, general foreman for Winston-Dear Co., was killed by a slide of rock and earth on the new Missouri Pacific double-track work east of Osage City, Missouri, January 21st.

Twin City Notes

BY J. C. YETTER

W. A. Nolan of Nolan Bros., Minneapolis, has recently had an operation. He is doing very well and will be leaving the hospital within a few days.

Schultz Brothers, Bowbells, North Dakota, were awarded a large grading job near Kenmare, North Dakota, recently.

The City of Duluth have postponed opening bids on the Point of Rocks project until February 15th.

The Minnesota Surveyors and Engineers Society will hold their annual convention in St. Paul on February 10, 11 and 12.

Canada

Montreal and Vicinity

BY J. M. WARD

It is expected that tenders will be called shortly for the construction of the 34 miles of railroad from St. Felicien to Mistassini to connect up with the Lake St. John Paper Company.

The Canadian National Railways will also proceed immediately with the construction of some branches from the new Rouyn Railway to connect with the various mines in the district.

The Power Corporation of Canada expect to proceed shortly with an $8,000,000 development on the Back River, Montreal.

The City of Montreal are preparing plans for three or four tunnels under the Lachine Canal.

We had a visit last week from Tom Gorman of Gorman & Peckham. He has left on a trip to Vancouver.

The Cooke Construction Co. of Montreal are at present working on some crib filling jobs for the St. Maurice Paper Co.

The Portneuf Company, St. Albans, Quebec, will be developing 4000 h.p. this summer.

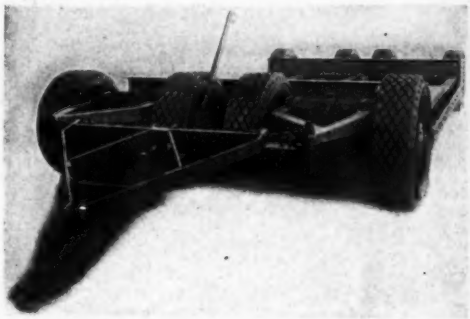
Tenders are in for the first lot of contracts for the Quebec Department of Highways, and results should be known within the next day or two.

The Municipality of Pont Rouge, Quebec, are considering new drainage system which will extend for four miles.

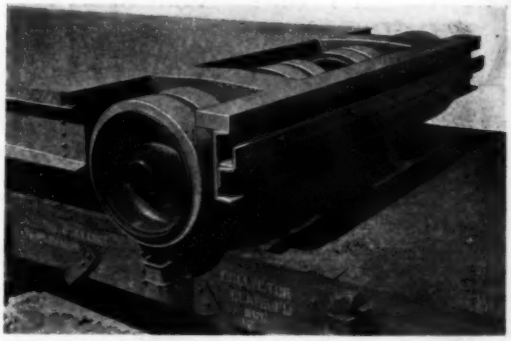
Haul Your Shovels with Your Own Trucks — and a Transport

TRAILER

(20 Tons to 50 Tons Capacity)



(Built to Carry Steam Shovels)



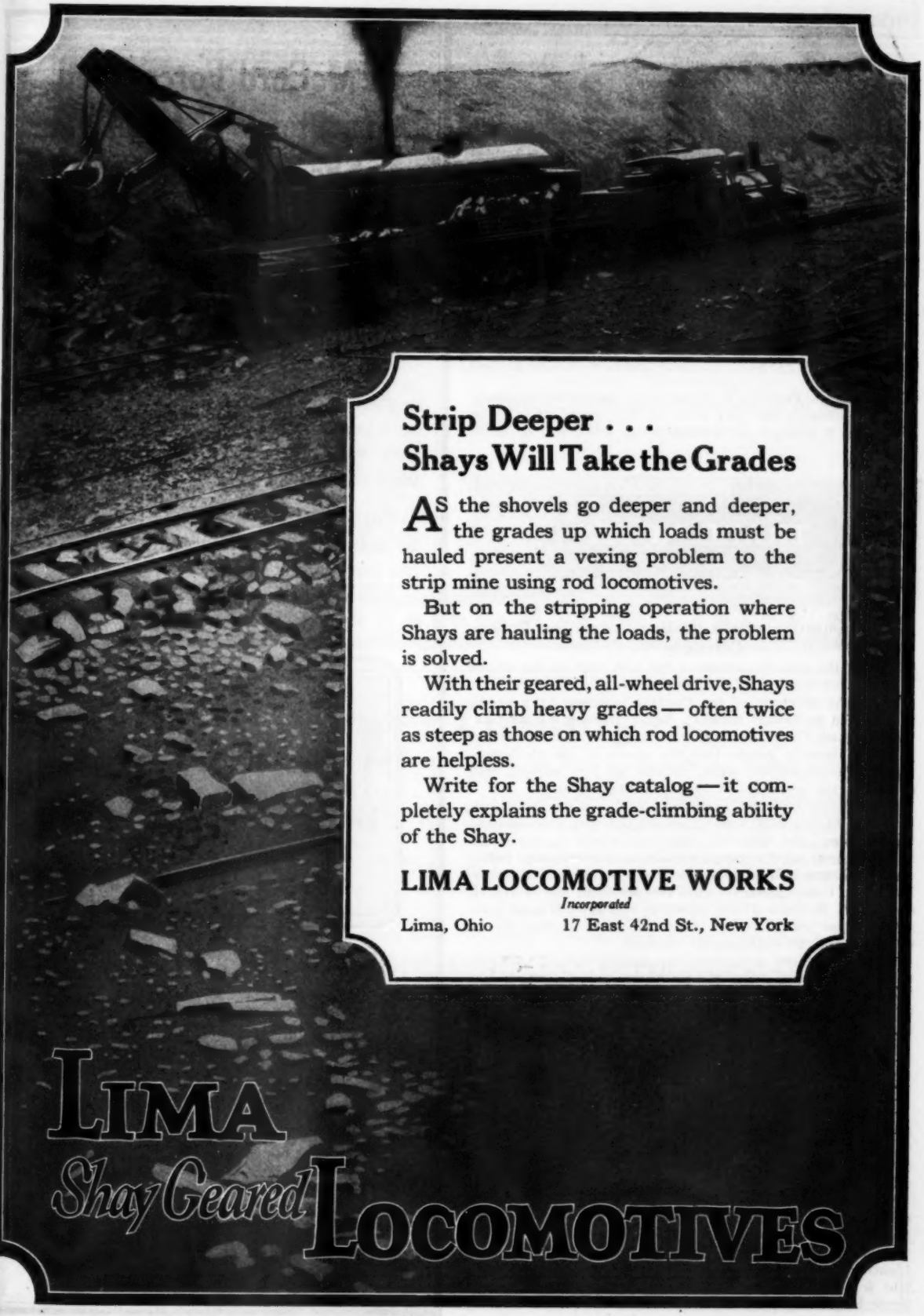
(Rear End Construction for End Loading)

Ask for Bulletin

BUCYRUS COMPANY

SPECIALTY DEPARTMENT

SOUTH MILWAUKEE, WIS., U. S. A.


Strip Deeper . . .
Shays Will Take the Grades
AS the shovels go deeper and deeper, the grades up which loads must be hauled present a vexing problem to the strip mine using rod locomotives.
But on the stripping operation where Shays are hauling the loads, the problem is solved.
With their geared, all-wheel drive, Shays readily climb heavy grades — often twice as steep as those on which rod locomotives are helpless.
Write for the Shay catalog — it completely explains the grade-climbing ability of the Shay.
LIMA LOCOMOTIVE WORKS
Incorporated
Lima, Ohio
17 East 42nd St., New York
LIMA
Shay Geared LOCOMOTIVES

In writing to Lima Locomotive Works, Inc., please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued

Toronto and Vicinity

BY C. F. ENGLAND

If present indications are correct there will soon be started in Toronto three new large hotel buildings. This should help out somewhat the building contractors and trades, as well as, of course, the excavating contractors.

The City of Toronto recently approved going ahead on a new duplicate waterworks system, including pumping station, plant, and equipment. This work when completed will involve an expenditure of some ten million dollars, and the work will take about five years to complete.

The Department of Public Highways of Ontario have called tenders, closing March 7th, for some considerable number of miles of pavement; concrete, asphalt macadam, and bituminous penetration are included, together also with some miles of grading work.

Some of the Counties in Ontario are putting considerable in their estimates for road work for this year. It is to be hoped and it appears as if construction work will be quite brisk.

TRADE NOTES

Reorganization of the Williamsport Wire Rope Company

One of the reorganizations of the new year is that of the *Williamsport Wire Rope Company of Williamsport, Pa.*

With the purchase of the Cochran interests by a syndicate headed by Robert Gilmore, Edgar Munson, Logan Cunningham and C. M. Ballard, the control of this important industry virtually passes into the hands of old employees. The new organization, while introducing new capital, will not affect the personnel of the old organization.

Mr. Robert Gilmore, president, continues as the directing head, having been actively associated with the company for 34 years. Mr. Gilmore's success has been most remarkable, and he is rated today as a leader in the wire rope industry. Mr. Edgar Munson becomes vice-president and treasurer. Mr. Logan Cunningham becomes vice-president and secretary, and Mr. C. M. Ballard, vice-president and general sales manager. These men have all been important factors in the upbuilding of the Williamsport industry.

Plans for new structures are being drafted, and the actual construction work will be started just as soon as the immense fill of the "White Basin" is completed. One new building will be 450 by 200 feet, and will be equipped with the most modern of labor-saving devices.

Two Westinghouse Subsidiaries Become Branch Works

The corporate form of two subsidiaries of the *Westinghouse Electric & Manufacturing Company* was discontinued today, and they were merged into the parent company as branch works, according to an announcement made by the management.

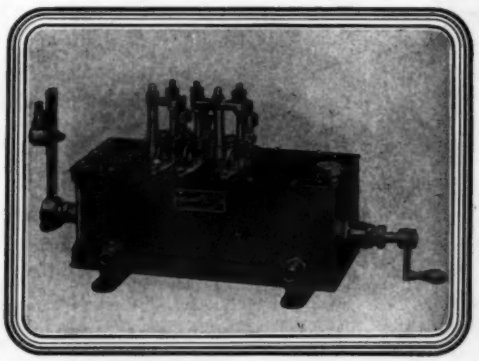
The companies so affected were the Westinghouse Electric Products Company of Mansfield, Ohio, and the George Cutter Company of South Bend, Indiana. In the future they will be designated as the Mansfield Works and the Street Lighting Department, respectively, of the Westinghouse Electric & Manufacturing Company, the latter including the South Bend Works, which is one of the largest in the country

A McCord Force Feed Lubricator Will Keep Your Shovel on the Job

A McCord force feed lubricator installed on your steam shovel now will insure more continuous operation. Dependable force feed lubrication prevents shutdowns and delays, it gives more hours on the job.

McCord force feed lubricators are used as standard equipment by the largest and best-known steam shovel builders and they will be installed on any shovel at your request.

Put a McCord lubricator on now and be assured of dependable lubrication for the life of your shovel.



McCord Class B. A. Force Feed Lubricator

McCord Radiator & Mfg. Co.
Detroit, Michigan

McCord
force feed
Lubricators

In writing to McCord Radiator & Mfg. Co. please use post card bound in the center of this number.

TWIN CITY ENGINES

Twin City Engine Operating Bucyrus Shovel

OTHER TWIN CITY users include Austin Machinery Co., Baldwin Locomotive Works, Buckeye Traction Ditcher Co., Cement Gun Contracting Co., Northwest Engineering Co., Pennsylvania Pump and Compressor Co., Sargent Tile Ditcher Co., Star Drilling Machine Co., Washington Iron Works, Willamette Iron & Steel Works, etc.

Twin City Engines are made in sizes 35 to 140 h. p. Write for literature.

Minneapolis Steel & Machinery Co.
Minneapolis, Minn.
Heavy Duty Engine Manufacturers Since 1903

"BUILT TO DO THE WORK"

Winter Drilling

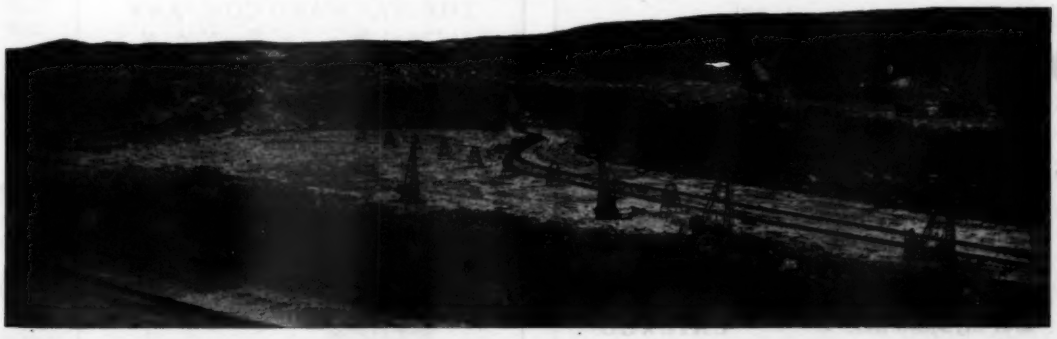
ON many rock jobs it is an advantage, if not a necessity, to continue drilling operations throughout the winter, even though the balance of the outfit may shut down for a month or two. This will provide drilling and blasting ahead for the Spring rush.

Winter drilling has no terrors for Cyclone No. 14 Big Blast Hole Drills. Their positive control in the form of a back-geared spudder, a geared hoist and worm-and-gear cable feed is not affected by wet and freezing weather as is the case with friction drives. Furthermore, the gears are Cast Steel, which does not become brittle in extremely cold weather as does cast iron.

These are some of the reasons why Cyclone Drills dominate in localities where the winters are severe, such as the Lake Superior Iron Ore district and in the Canadian limestone quarries. The illustration below, taken in February, shows seven of the twelve Cyclones used by Canada Crushed Stone Company at their Dundas, Ontario, quarry.

Our 100-page catalogue "BIG BLAST HOLE DRILLS" should be in the hands of every open-cut rock mover. Ask for it.

THE SANDERSON-CYCLONE DRILL CO., Orrville, Ohio, U.S.A.
Eastern and Export Office: 30 Church Street, New York, N. Y.



TRADE NOTES — Continued

devoted to the manufacture of street-lighting equipment, with branches for the manufacture of poles of the "hollow-spun" type located in Milwaukee, St. Louis and Valdosta, Ga.

The Mansfield Works is devoted to the manufacture of domestic electric appliances, including electric ranges and ovens and safety switches.

It is with deep sorrow that we learn of the death of Mr. I. T. Goodrich, General Sales Manager of the Miami Trailer-Scraper Company at Troy, Ohio.

Mr. Goodrich was 49 years of age, and was born in Rondout, New York. He leaves a wife, one son and one daughter.

BOOK REVIEWS

We shall be glad to review such books and catalogs as are sent us

BABBITT METAL DATA — 3½ x 6½, 24 pages, with illustrations. This publication is the result of tests carried on in the laboratory of the Hoyt Metal Company, with certain of the data through the aid of the American Society for Testing Materials. Copies may be obtained by writing to the *Hoyt Metal Company, Boatmen's Bank Building, St. Louis, Missouri.*

TRUSCON PRESSED STEEL — 28 pages, size 8½ x 11, with many illustrations. This catalog illustrates a selection of pressed steel parts which are produced in the plant of the Truscon Steel Company. Copies may be obtained by writing to the *Truscon Steel Company, Youngstown, Ohio.*

SCHRAMM AIR COMPRESSORS — 7½ x 10¾, 32 pages and cover. Profusely illustrated. Describes, illustrates and gives brief specifications of Schramm Air Compressors and Pneumatic Tools. Includes compressors of sizes from 60 to 240 feet per minute on various mountings, including tractor drawn. Copy may be obtained from *Schramm, Inc., West Chester, Pennsylvania.*

DITCHING SNAPSHOTS AND RECORDS — 8½ x 11, 32 pages and cover, illustrating and describing many jobs done by the Barber-Greene ditcher conveyors and loaders. Many illustrations make the catalog unusually explicit. Copy may be obtained from the *Barber-Greene Company, Aurora, Ill.*

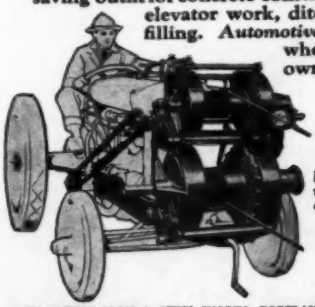
WHY Palmer Molded Brake Blocks Are Cheaper—

1. They wear twice as long as the ordinary kind.
2. They therefore cost less for renewal labor.
3. They avert expensive shut-downs by keeping your machine in service longer.

PALMER ASBESTOS & RUBBER CORP.
2741 Clybourn Ave. CHICAGO

big returns for Contractors on a small investment

Attach an Allison-Willamette to a standard Fordson and you have a time and money saving outfit for concrete construction jobs, elevator work, ditching, backfilling. *Automotive*—goes anywhere under its own power. . . Write for literature.



Wherever a heavy lift or pull is required, there's a job for the— Allison HOIST

WILLAMETTE IRON & STEEL WORKS, PORTLAND, OREGON, U. S. A.

Willamette automotive hoists

ALLISON FOR THE FORDSON ~ WILLAMETTE FOR THE CATERPILLAR

Hayward Buckets

IT is the smaller investment in the bucket that controls the returns from the greater investment in the hoist, crane or other type of hoisting unit.

That is why we urge you to be sure that your bucket is fitted to its job. Only from a complete line of buckets, such as is offered by Hayward, is this economically possible.

Let us show you what can be accomplished. A letter will receive our immediate attention.

THE HAYWARD COMPANY
52-54 Church St. New York, N. Y.

THE EXPLOSIVES ENGINEER — FORERUNNER OF PROGRESS

The title of this advertisement is also the title of a motion picture film that illustrates the part played by men who move materials with explosives in the great industrial undertakings of our times. It shows how engineering methods have transformed blasting from an uncertain, hit-or-miss operation into a science based on mathematical calculations. It illustrates the opportunities in this newest branch of the engineering profession.

More than this: it takes you behind the scenes in the great testing laboratories maintained by the United States Bureau of Mines and by one of the largest manufacturers of explosives, and shows you the exacting care with which explosives are tested in order that the tools of the explosives engineer may be as dependable as his figures.

"The Explosives Engineer — Forerunner of Progress" is contributed to the cause of industrial education. Together with another new Hercules film it will provide an evening of dramatic and instructive entertainment.

The other new film dispels the mystery that has heretofore surrounded the manufacture of electric blasting caps. This film clearly shows the manufacture and features of the Hercules Electric Blasting Cap. It illustrates the marked advantages of the larger diameter cap shell, adequate water-proofing, and platinum bridge.

Upon request, either or both of these films will be loaned without charge. Please let us know the date on which you wish to make your showing and we shall forward one or both, prepaid. Kindly use the coupon.

HERCULES POWDER COMPANY
(INCORPORATED)

Dynamite—Permissible Explosives—Blasting Powder—Blasting Supplies

Sales Offices:

ALLENTOWN, PA.
BIRMINGHAM
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PITTSBURGH
POTTSVILLE, PA.
ST. LOUIS
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SAN FRANCISCO
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WILMINGTON, DEL.

HERCULES POWDER COMPANY,
949 King Street, Wilmington, Delaware

I should like to show your film (or films):

☐ "The Explosives Engineer — Forerunner of Progress."
☐ "The Manufacture of Electric Blasting Caps."

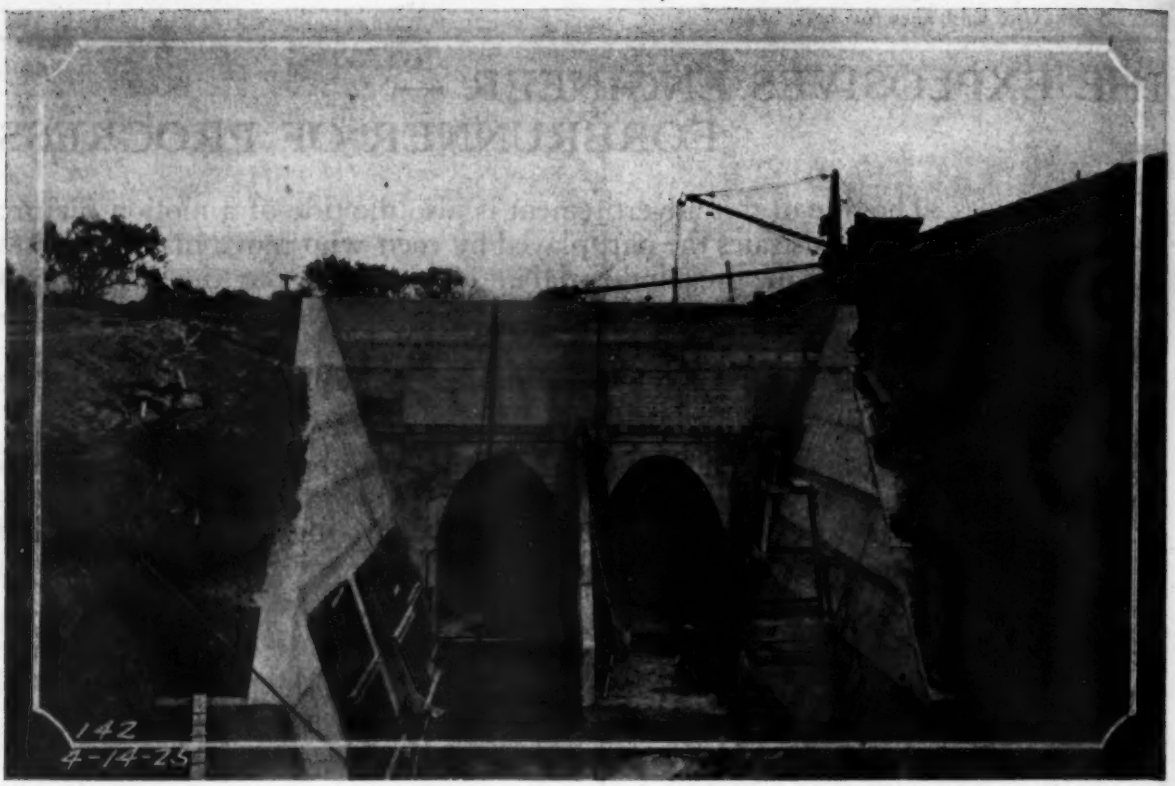
on..... before.....

Name.....

Position.....

Address.....

In writing to Hercules Powder Co., Inc., please use post card bound in the center of this number.



The Outlet Conduits in the Dam, Looking Downstream. The valves controlling these conduits are operated from a gate-house on top of the dam.

Excavation on the Downstream Slope of the Spillway — a Good View of the Thickness of the Apron.